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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/668,856	09/25/2000	Richard L. Goodson	H-0148	2791

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WADDEY & PATTERSON
414 UNION STREET, SUITE 2020
BANK OF AMERICA PLAZA
NASHVILLE, TN 37219

EXAMINER	
PATHAK, SUDHANSHU C	
ART UNIT	**PAPER NUMBER**
2634	4

DATE MAILED: 01/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/668,856	GOODSON ET AL.	
	Examiner	Art Unit	
	Sudhanshu C. Pathak	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 25th September, 2000.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-22 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-22 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Claims 1-to-22 are pending in the application.

Specification

2. The disclosure is objected to because of the following informalities:

   On Page 13, line 3, the word "symbols is misspelled.

   Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

   The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 7-13 & 22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding to Claims 7-13 & 22, the specification does not describe the limitation of copying the training information from the receiver descrambler to a training scrambler having an output functionally linked to the channel equalizers.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

   A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-6, 10-13, 15, 16, 20 & 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Cupo et al. (5,163,066).

Regarding to Claims 1, 4, 10-13, 15, 16, 20 & 21, Cupo discloses a dual-duplex communications system wherein data is distributed and transmitted through a plurality of communications channels (Fig. 1-Fig. 4 & Abstract, lines 1-6 & 17-21). Cupo further discloses transmission of data over two bidirectional transmission channels (Column 1, lines 37-39) and each duplex communications channel includes a transmitter and a receiver along with a communications signal path there between (Column 1, lines 23-29 & Fig. 1-Fig. 4). Cupo discloses the transmission channels to include local subscriber loops i.e. wire connecting a remote device with a central office in a public communications network (Column 1, lines 29-31 & 50-54). Capo further discloses synchronizing the operation of multiple transceivers utilizing multiple transmission channels (Column 2, lines 26-31 & Column 1, lines 63-66 & Fig. 1-Fig. 4). Cupo discloses operating the system in "start-up" or training mode to initialize the timing synchronizing (Column 1, lines 44-49 & Column 2, lines 34-44 & Column 3, lines 24-32 & 43-47). Capo further discloses directing concurrently an identical training sequence from the transmitter to initialize the receiver's equalizers over multiple transmission channels (Column 2, lines 30-44 & Column 3, lines 63-67 & Fig. 1-Fig. 2). Capo also discloses that the training sequence at start-up automatically adjusts the receiver equalizer parameters on both the channels (Column 4, lines 5-24). Capo further discloses switching the transceivers to normal

or "run" or data mode after the synchronization of the receivers has been achieved (Column 3, lines 35-43 & Fig. 1, elements 110, 111, 112 & Fig. 3-Fig. 4). Capo also discloses that the training sequence at start-up automatically adjusts the receiver equalizer parameters (coefficients) on both the channels (Column 4, lines 5-24 & Abstract, lines 5-8 & Fig. 2, elements 203, 204). Capo also discloses that the data at some predetermined rate is evenly divided between the communications channel so that the data rate in each channel is half the predetermined data rate (Column 1, lines 37-49). Capo discloses transmitting and receiving the streams (Fig. 1 & Fig. 2) and furthermore combining the received streams (Fig. 2, element 224) to form an output data stream (Fig. 2, element 225).

Regarding to Claims 2 & 3, Cupo discloses a dual-duplex communications system wherein data is distributed and transmitted through a plurality of communications channels as described above. Cupo discloses operating the system in "start-up" or training mode to initialize the timing synchronizing between the transmission channels (Column 1, lines 44-49 & Column 2, lines 34-44 & Column 3, lines 24-32 & 43-47). Capo further discloses directing concurrently an identical training sequence from the transmitter to initialize the receiver's equalizers over multiple transmission channels (Column 2, lines 30-44 & Column 3, lines 63-67 & Fig. 1-Fig. 2). Capo also discloses that the training sequence at start-up automatically adjusts the receiver equalizer parameters (coefficients) on both the channels (Column 4, lines 5-24 & Abstract, lines 5-8 & Fig. 2, elements 203, 204). Capo further discloses that the predetermined training sequence transmitted by the

transmitter is stored in the receiver (Fig. 2, element 205 & Column 4, lines 32-39), and the ideal training sequence is compared to the received training sequence to recognize the received signal and then generate an error signal which is used to adjust or update the equalizer coefficients (Column 4, lines 63-68 & Fig. 2, elements 213, 214, 215, 216, 203).

Regarding to Claims 5 & 6, Cupo discloses a dual-duplex communications system wherein data is distributed and transmitted through a plurality of communications channels as described above. Cupo further discloses a data signal source (Fig. 1, element 101) to be used in the training mode of the multi-channel receiver equalizers (Column 3, lines 47-53) wherein the training sequence is actual data selected by the user. Furthermore, configuring the transmitter switches (Fig. 1, elements 110, 111 & 112) to position (Fig. 1, elements 113, 114 & 115) respectively and the receiver switch as configured in (Fig. 3, element 303) the training sequence transmitted through the channels have different reference signals (Fig. 3, elements 212, 213). Capo discloses using different streams of training sequence to train the different channels (Fig. 1 & Fig. 3 & Column 3, lines 51-55 & Column 5, lines 25-57).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 7, 8, 14, 17-19 & 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cupo et al. (5,163,066) et al. in view of Gonikberg (6,618,451).

Regarding to Claims 7, 8, 14, 19 & 22, Cupo discloses a dual-duplex communications system wherein data is distributed and transmitted through a plurality of communications channels having different propagation delays (Fig. 1-Fig. 4 & Abstract, lines 1-6 & 17-21). Cupo further discloses transmission of data over two bidirectional transmission channels (Column 1, lines 37-39) and each duplex communications channel includes a transmitter and a receiver along with a communications signal path there between (Column 1, lines 23-29 & Fig. 1-Fig. 4). Cupo discloses the transmission channels to include local subscriber loops i.e. wire connecting a remote device with a central office in a public communications network (Column 1, lines 29-31 & 50-54). Cupo discloses operating the system in "start-up" or training mode to initialize the timing synchronizing (Column 1, lines 44-49 & Column 2, lines 34-44 & Column 3, lines 24-32 & 43-47). Capo further discloses directing concurrently an identical training sequence from the transmitter to initialize the receiver's equalizers over multiple transmission channels (Column 2, lines 30-44 & Column 3, lines 63-67 & Fig. 1-Fig. 2). Capo also discloses implementing a splitter to separate the input data stream into two separate data streams (Column 3, lines 18-23 & Fig. 1, element 107). Capo discloses transmitting and receiving the streams (Fig. 1 & Fig. 2) and furthermore combining the received streams (Fig. 2, element 224) to form an output data stream (Fig. 2, element 225). Capo also discloses that the training sequence at start-up automatically adjusts the receiver

equalizer parameters on both the channels (Column 4, lines 5-24). Capo also discloses that the training sequence transmitted can be "ideal" or predetermined set of data bits and symbols (Fig. 1, element 102) already known by the receiver (Fig. 2, element 205). Capo further discloses switching the transceivers to normal or "run" or data mode after the synchronization of the receivers has been achieved (Column 3, lines 35-43 & Fig. 1, elements 110, 111, 112 & Fig. 3-Fig. 4). However, Capo does not disclose the transmitted training sequence to be scrambled ones and the receiver equalizer to be linear.

Gonikberg discloses a digital communications system employing modems for transmitting and receiving data over band-limited communications channels like telephone lines (Column 1, lines 11-18). Gonikberg discloses the transmitter of the modem (Fig. 2, element 201) to include a transmit data module (Fig. 2, element 205). Gonikberg discloses that the transmit data module supplies bits to the encoder which are either generated internally in the training mode or fetches them from an external data source in the data mode and then scrambles the data and passes it to the encoder which encodes the bits into symbols (Column 6, lines 8-16). Gonikberg also discloses implementing a linear equalizer at the receiver to minimize the distortion and interference of the received data (Column 2, lines 63-67 & Column 3, lines 3-9). Gonikberg further discloses implementing the equalizer with a combination of forward equalizer (FE) and the feedback equalizer (FBE), and furthermore both the FE and FBE can be implemented as linear FIR filters (Column 3, lines 18-33). Gonikberg also discloses the receiver to (Fig. 2, element 203) to

comprise a receive data module (Fig. 2, element 231) to descramble the bit stream and pass the data (Column 6, lines 45-51). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that implementing the scrambler and the linear equalizer as described in Gonikberg in the transceiver system as described in Cupo improves the reliability of the data received and increases the data rate of the transmitted data. Furthermore, there is no criticality in selecting a training sequence comprising a sequence of ones; it is a matter of design choice and can be implemented as the training sequence in the training sequence generator as described in Cupo.

Regarding to Claims 17 & 18, Cupo discloses a dual-duplex communications system wherein data is distributed and transmitted through a plurality of communications channels as described above. Cupo further discloses the training sequence to be generated using the ideal signal sequence generator (Fig. 1, element 102), which is known in the receiver (Fig. 2, element 205). However, Capo does not disclose the transmitted training sequence to be scrambled.

Gonikberg discloses a digital communications system employing modems for transmitting and receiving data over band-limited communications channels like telephone lines (Column 1, lines 11-18). Gonikberg discloses the transmitter of the modem (Fig. 2, element 201) to include a transmit data module (Fig. 2, element 205). Gonikberg discloses that the transmit data module supplies bits to the encoder which are either generated internally in the training mode or fetches them from an external data source in the data mode and then scrambles the data and

passes it to the encoder which encodes the bits into symbols (Column 6, lines 8-16). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that implementing the scrambler as described in Gonikberg in the transceiver system as described in Cupo improves the reliability of the data received and increases the data rate of the transmitted data.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cupo et al. (5,163,066) et al. in view of Gonikberg (6,618,451) in further view of Langberg (5,703,905).

Regarding to Claim 9, Cupo in view of Gonikberg discloses a dual-duplex communications system wherein data is distributed and transmitted through a plurality of communications channels as described above. However Cupo in view of Gonikberg does not specify the modulation scheme implemented during the transmission of the training sequence.

Langberg discloses an N-channel receiver system wherein each channel having a receiver and a transmitter (Fig. 1 & Column 3, lines 17-27). Langberg also discloses the transmitter to be at the central office and the receiver at the customer's premise and vice versa (Column 3, lines 17-27 & Column 3, lines 51-60). Langberg further discloses the invention of timing synchronization in a multi-channel system to be implemented using any number of suitable modulation schemes at any baud or bit rate (Column 3, lines 61-67). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention that Langberg teaches that timing recovery and synchronization as described in Capo in view of Gonikberg is possible

using any modulation scheme and therefore there is no criticality in implementing a 1-QAM scheme and it is merely a design choice.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (703)-305-0341. The examiner can normally be reached (Monday-Friday) from 8:30 AM to 5:30PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin, can be reached at: (703) 305-4714. Any response to this action should be mailed to: Commissioner of Patents and Trademarks

Washington, D.C., 20231

Or faxed to: (703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be bought to: Crystal Park II

2121 Crystal Drive

Arlington, VA., Sixth Floor (Receptionist).

January 6th, 2004.
Sudhanshu C. Pathak – Examiner Art Unit 2634

STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600